**Theses of doctoral (PhD) dissertation**

# COMPETITIVENESS IN THE LIGHT OF SPORTS HABITS

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## 1. PRELIMINARIES AND OBJECTIVES OF THE DOCTORAL THESES

Our research was focusing on why people do not do enough sports that would be necessary to build a healthy society. 20 years ago, the main cause of mortality in Hungary was reported to be infectious diseases. We considered this fact to be the root of the problem. Currently, cardiovascular diseases are the cause of more than 50% of deaths.

This research work aimed at exploring how the fitness of the different age groups in this region compares to the average values in Hungary, as well as a different Hungarian region, considering the respective cultural and historical traditions. Questionnaire surveys were carried out focusing on the sports habits of the North Great Plain region's population in order to understand which factors affect fitness and what consequences will follow at adult and old age from the aspect of the sports habits of the given population.

It was also an objective to identify the factors which determine one's needs to do sports and also the reasons which hold back people from doing sports so that some people do less sports or do not do sports at all.

It was an important purpose to examine which age group (broken down to gender) prefers which branches of sports and sports activities, considering the fact that this information may fundamentally determine the development directions of the region's sports infrastructure.

Due to the fact that sports habits are basically developed at young age, it was an objective to examine the current situation of the Hungarian sports school system, as well as its infrastructural background and the range of sports activities which these institutions establish opportunities to perform

Altogether, these analyses serve the purpose to provide a comprehensive view of the sports habits of the region's population, as well as to pinpoint the possible development strategies.

## 2. MATERIAL AND METHOD

During our analyses, we were seeking regional differences between the health, lifestyle and physical activity of the population.

In order to observe these differences, we used the databases of international (Eurostat) and Hungarian surveys (HCSO, Netfit, Ifjúság 2015) and compared the selected regions to each other accordingly. At the same time, we performed (1-3) questionnaire surveys in accordance with the following:

### I. Analysis of the NETFIT database

In our work, we compared the national and regional (North great plain and West Hungarian regions) NETFIT data accessible on the Internet (http://www.netfit.eu/). Considering the fact that only two of these surveys were carried out, we did not perform any time-series analysis of this examination. The detailed results of the 2015/2016 school year were not accessible at the time of preparing our thesis; therefore, we could only analyse national tendencies using 2015/2016 data and we performed all detailed analyses based on 2014/2015 data.

During our research, we have always considered it to be important to analyse differences between genders. For this reason, we covered the differences between males and females during the analysis of Netfit data. In addition, we also considered it to be important to compare the results of the youngest and oldest subjects (5th and 12th grades).

### II. Examination of sports habits

The survey was performed in the city of Debrecen during the summer of 2014, with the involvement of 273 people. The average age of respondents was 28.4±11.3 years. The questionnaires were filled out with the help of interviewers. The filled out questionnaires were processed using EvaSys (http://www.vsl.hu).

The questionnaire contained 13 questions, covering the analysis of the following topics: socio-demographic data such as the age, gender and educational level of respondents, as well as the total income of their families and their place of residence.

Furthermore, the questionnaire aimed to reveal the sports habits of respondents, focusing on the frequency and reason of doing sports, as well as the factors influencing the selection of a specific branch of sports. We were also looking for the reason why sports is important for the given respondent. Respondents were asked what kind of sports facilities they would consider it to be important to be established in the city and whether they would pay for using the services

these facilities could offer. The last part of the questionnaire was focusing on the sports events that respondents usually visit.

Analyses per age group were performed using Chi square test and Fisher's exact test. The attendance of various sports events broken down to branch of sports and the following of events were also observed using correlation analysis (Spearman's correlation). The other purpose of analysis was to reveal differences between genders. The analysis of data was performed by creating cross tables, the related Chi square test and Fisher's exact test.

**III. Sports habits at old age**

The survey was performed during the spring of 2016, involving 250 people in Debrecen and the surrounding settlements. The questionnaires were filled out with the help of interviewers. The average age of respondents was 67.8±7.5 years. The filled out questionnaires were processed using EvaSys.

The questionnaire covered the following 13 areas: socio-demographic data such as the age, gender and educational level of respondents, as well as the total per capita income of their families. Furthermore, the questionnaire aimed to reveal the sports habits of respondents, focusing on the frequency and reason of doing sports, as well as the factors influencing the selection of a specific branch of sports. Respondents who did not do any sports were also asked whether they perform any other physical exercises and what kind of exercises these are. The analysis also covered the differences between genders and age groups.

**IV. Sports school system in Hungary**

This survey was performed in a telephone interview-based questionnaire form in the spring of 2016. Currently, 16 association-related and 38 public education sports schools are active in Hungary. Of these, 52 schools were involved in the survey.

The questionnaire was focusing on whether these institutions are evenly distributed in the different regions of Hungary, how many branches of sports they train, what is the age composition of their students and whether these sports schools have the infrastructural background necessary for performing their tasks.

Data was processed using EvaSys. Chi square test was used to reveal significant differences. Correlation was examined using Spearman's rank correlation analysis and the correlation efficient (r) was also provided.

Mean ±SD was indicated in all cases during the description of data. Differences were considered to be significant if $p<0.05$.

## 3. RESULTS

### a. Results of own surveys

### I. Sports habits in the North Great Plain region

Questions focusing on sports habits covered the frequency of doing sports during the last few months. 45.5% of respondents reported that they were doing sports once a week, 20.7% indicated once a day and 18% responded “I do not do sports at all”. 15.8% of respondents do some sort of sports activities once in a month.

Respondents were asked about the reason for not doing sports, too. 40.5% indicated lack of time, while two other big groups referred to either lack of motivation or fatigue. 9% do not do sports due to their health status and another 9% are hindered by the lack of opportunities to do sports.

Respondents were also probed for why sports are important for them and 44.3% answered that sports helped them maintain their health status. 24.8% consider sports to be important in order to maintain their fitness and physique, while 17.4% responded that sports make them forget their problems and help them relax.

Multiple answers could be provided to the question “What kind of sports events do you attend?”. Football was indicated by 46% of respondents, swimming by 21%, handball by 20.3%, basketball by 14.5% and water polo by 19%.

**Gender-related differences**

It was one of the main purposes of evaluation to reveal gender-related differences.
There were no differences between men and women in terms of the frequency of doing sports.

Based on the examination of the reasons for not doing sports, no differences were observed between women and men (Chi square value = 8.481, df = 8, p = 0.398; Fisher’s exact test p = 0.388).
When examining the gender-related differences of choosing a specific branch of sports, the following findings were obtained:

There were no differences between men and women in terms of using pay services in sports facilities (Chi square value = 0.037, df = 1, p = 0.886; Fisher's exact test p = 0.886).
There were no differences between men and women in the forming an opinion about why the recommended facility would be appropriate (Chi square value = 1.834, df = 5, p = 0.879; Fisher's exact test p = 0.880).

There were no gender-related differences in terms of the individual evaluation of the importance of doing sports (Chi square value = 6.152, df = 5, p = 0.300; Fisher's exact test p = 0.304).

As regards the selection of a given branch of sports, there were no differences between men and women in terms of competition possibilities, achieving success, development of stamina, contribution to being healthy, doing sports in order to improve one's health, keeping track of the sports habits of parents/siblings, considering successful branches of sports in Hungary, the distance between the place of residence and place of doing sports, financial affordability, the importance of outdoor training, personal interest, and the necessity of equipment and preparation.
There was a difference when considering the sports habits among respondents' friends (Pearson's chi square test value = 11.492, df = 1, p = 0.001.). 25.5% of men consider it to be important to keep track of their friends (every fourth respondent), while this value is only 9.9% among women (every $10^{th}$ woman).
There was a difference in the evaluation of the likeability of the trainer (Pearson's chi square test value = 5.125, df = 1, p = 0.024.). Women consider the personality of the trainer to be more important, as well as sympathy with the trainer (10.6%), while men consider this aspect to be much less significant (3.3%).
The role of improving one's figure and efficient fat loss has a marginal importance in sports. Statistical tests do not make it clear, but only suggest that women's response (34.8%) and men's response (23.3%) significantly differ from each other. Pearson's chi square test value = 4.064, df = 1, p = 0.056. According to Fisher's exact test, the identical distribution in the two groups has to be ruled out (p = 0.056).

When examining the interest shown in sports, the expected results were obtained. Accordingly, there is no difference between the interest of men and women in the case of the following branches of sports: table tennis, athletics, wrestling, rowing, canoeing, handball, basketball, tennis, gymnastics, swimming, water polo.

A difference was shown in the case of the following branches of sports: sports preferred by men: ice hockey, football, boxing; sports preferred by women: volleyball, figure skating, speed skating.
According to the obtained data, football (46.0%) and swimming (21.7%) are the most popular, followed by ballgames: handball (20.3%), water polo (19.2%) and basketball (14.5%). Wrestling (2.5%), table tennis (2.9%) and rowing (3.6%) are the least followed branches of sports.

**Age group analysis**

The age group analysis of the survey was also performed using cross table analyses, chi square test and Fisher's exact test.
The frequency of doing sports is different in each age group (chi square test, p=0.000, df=12, chi square test=42.215.). Younger age groups usually do sports once per week (56.0%; 45.9%; 44.9% in each age group, respectively). However, people above 40 years of age usually stop doing sports (51.9%; 50.0% in each age group, respectively). At the same time, it can be observed that the 26.9% weekly frequency of doing sports of the age group between 41-56 years is divided into two frequencies at old age: more and less frequent (41-65 years of age -> once per week 29.6%; above 65 years of age -> once per week 0.0%). On the one hand the daily and monthly frequency of doing sports increases above 65 years of age, while then activity of weekly frequency decreases on the other.

No difference is observed between age groups in terms of the reasons of not doing sports. The most typical reason is lack of time. Fatigue is an often referred to reason among people at middle age and old age. Also, it can be observed that the reference to health status becomes more frequent with age.

People in different age groups think similarly about the use of pay facilities. There is no significant difference in terms of age considering why respondents consider the suggested sports facilities to be advantageous. The reasoning of the importance of sports is similar in each age group.

Age group-related difference is not typical in the case of either sports selection aspect. The sample reflects the consideration of health care aspects per age and the decreasing importance of financial relations.

When asked about their opinions about any further necessary sports facilities, most respondents recommended swimming pools, gym, outdoor gym and indoor-track. 51.6% of respondents explained their response by indicating that these facilities would be beneficial for the city and its population, while the response of 25.8% was based on their individual need.

**II. Sports habits at old age**

Based on the previous questionnaire survey, it was obvious that certain changes occur in the sports habits of elderly people (especially those above 60 years of age). In order to reveal this change more accurately, a survey was performed to specifically target the elderly population.

The average age of respondents was 67.8±7.5 years. The proportion of genders was 46.4% (women) / 53.6% (men).
As regards sports habits, the questionnaire first focused on the frequency of doing sports in the last few months. 30.6% of respondents indicated that they were doing sports every week, 2% did sports daily, while 51.4% indicated that they did not do sports at all. 15.6% perform some sort of sports activities once per month. 38.9% of elderly respondents indicated their health status as the reason of not doing sports, while several people responded “I do not consider it important” and “lack of money”. 5.6% referred to the lack of motivation and 5.6% indicated the lack of proper physical activities and sports opportunities as factors preventing respondents from doing sports.

When comparing the obtained data to the responses from the previous study focusing on younger age groups, it can be observed that the reference to health status appears in nearly all age groups, but the rest of the most frequently mentioned reasons are different.
Respondents were asked about why sports are important for them and more than one quarter of elderly respondents indicated “the physician’s recommendation” (28.3%) and the same proportion (28.3%) indicated “leisure”. 20.8% consider sports to be important in order to “counterbalance the effects of ageing”, while 11.3% think that sports help them maintain their health status and physical condition.

Comparing the obtained results to the data of the survey focusing on younger age groups, it can be observed that the arguments are the same, but the proportions are different.

The aspects of selecting a specific branch of sports significantly differ in both surveys. At young age, fat loss, improving one's figure and stamina, as well as personal interest are the most important aspects, while older respondents mainly prefer health preservation and spending time with friends. Affordability is an important factor for both groups.

It is not surprising that young respondents who do not do sports most frequently refer to fatigue and lack of time, while there were only a very few older respondents who similarly do not do sports and complained about the lack of time (1.9%; $p<0.005$), which is understandable. Elderly respondents belonging in the category of "not doing sports regularly" most often referred to their health status as a cause (38.9%; $p<0.005$). In addition, many people in this age group (29.6%) do not even consider doing sports actively to be important at all ($p<0.005$). The proportion of those referring to the lack of money due to the previously mentioned low income was also high (14.8%). This is a less significant aspect in the case of young people (7.9%; $p<0.025$).

During the analysis performed among older respondents, they were also asked to specify the sports activities they are engaged in. Most of them indicated swimming (16.4%) and walking (16%), in addition to going on a hike or excursion which they referred to in the descriptive part of the questionnaire.
Respondents were also asked about other regularly performed physical activities. Based on the obtained results, it can be concluded that 34% regularly walk and 23.2% use the bicycle for at least 20-30 minutes to run errands and do shopping. 22% of respondents indicated gardening, while 29.2% mentioned housework (e.g. cleaning).
It was also the purpose of the analysis to explore differences between genders.

There was no substantial difference between men and women in terms of the frequency of doing sports, as 44.8% of interviewed women and 51.4% of men do physical exercises on a regular basis.
However, there is a definite difference between men and women in terms of selecting a specific branch of sports and sports habits.

In the case of men, the selection of sports is usually determined by friends (21.6%; $p<0.005$), while women consider saying healthy to be the primary aspect (18.8%; $p<0.005$).
Men mostly prefer some kind of ballgames (mainly football, $p<0.025$), while women tend to prefer swimming (21.1%; $p<0.005$) and riding the bicycle (14.8%; $p<0.01$) and a higher proportion of women exercise yoga ($p<0.05$) and therapeutic gymnastics ($p<0.01$) than men.
It also has to be added that the proportion of those indicating physical exercises related to housework is significantly higher in the case of women, while those indicating walking as a response was also higher among women.
When comparing the responses of different age groups, it could be observed that preserving one's stamina and health is an aspect of decreasing importance when selecting a specific branch of sport as people get older ($r = -0.943$; $p<0.001$). On the contrary, spending time together with acquaintances and friends is becoming increasingly important ($r = 0.999$; $p<0.0001$). This conclusion shows that organised community events could play a key role in increasing the physical activity of elderly people.
Considering the fact that the reference to riding the bicycle is rather frequent up to 70 years of age, while swimming and yoga are often indicated even at the age of 80, it would be important to consider the fact that increasing the number of facilities which enable such activities (swimming pool, gym, bicycle paths) could contribute to make it possible for more elderly people to engage in physical activities at old age.

## III. Sports school system

The sports school program started in the 2007/2008 school year in an ascending system.
According to the relevant regulations, there are two forms of sports schools: public education and association schools. Accordingly, public education sports schools are institutions which belong to the scope of the law of public education and they prepare their training programme in accordance with the sports school framework curriculum, provide the advanced level training of physical education, contribute to the preparation and competitive activities of athletes and perform their activities in cooperation with a sports association, sports business or foundation. Association sports schools take part in training tasks, providing the necessary conditions and the preparation and competition of athletes in cooperation with public education institutions and/or national sports unions.

As part of this analysis, the current distribution of sports schools in Hungary was examined. When examining the distribution of the number of different branches of sports in each sports schools, it can be concluded that each school trains at least two branches of sports and most schools train 2-5 branches of sports, while there are several institutions in which even up to 10 or more branches of sports are represented (Figure 10). When examining the data broken down to school type, significant difference can be observed between each type ($p<0.01$). In the case of public education schools, usually six or less branches of sports can be opted for, while association schools usually offer more than six branches of sports.

Currently, 35 831 students take part in the sports school programme in Hungary. 45.47% of these students are female and 54.53% are male, which is not a significant difference ($p>0.3$) between genders. The number of students in each school are show big differences, as there are schools with as few as 50 students, while some are attended by even 1800 students. It can be observed that the overwhelming majority of institutions training less than 600 athletes ($p<0.01$) are association schools, while only public education institutions host more than 1500 students.

When examining the distribution of age groups, it can be observed, that only public education schools train children under 6 years of age, while only association schools train people above 18 years of age. Accordingly, the examination of the age group distribution between each school type, it can be observed that association schools are becoming more preferred with age ($r=1$).

When examining the infrastructural background of each school, it can be concluded that all of them have certain sports facilities. At the same time, the infrastructure needed for the branches of sports trained in these schools is present only in 50% of them.
Facilities which are necessary but not in the possession of sports schools are provided through rental. The overwhelming majority (75%) of institutions have sports grounds and gyms, while facilities serving a specific branch of sports (such as swimming pool, tennis court, ice rink) are present in or rented by mainly association schools.

**Conclusions and recommendations**

An extensive survey was conducted focusing on the sports habits of the population of Northeastern Hungary. The socio-demographic characteristics of respondents, including the per capita monthly income, were in accordance with the Hungarian average.

The number of respondents indicating per capita income lower than 100 000 HUF was high among those younger than 20, which supposedly reflects the financial support of their parents. At the same time, this amount of money probably covers the costs of education, housing and eating, but there is little left for using sports facilities. This fact, together with expectations at the school, may explain the observation that the number of those who do not perform regular physical activities is rather high even in the youngest age group (Christensen and Sorrensen, 2009).

The majority of those who do not do sports at all indicated lack of time as a reason. In the case of those between 30-40 years of age, the background of not having enough time mostly lies in the expectations of their workplace and second job and, as a matter of course, the time consumed by the family and children. The lack of motivation was also an important reason, which probably has to do with these respondents' social and family background and the fact that they have never engaged in regular physical exercises in their lives.

The survey results fall in line with the Government's objectives to build further indoor swimming pools, as these are the first on the list of facilities which respondents would be the happiest to have as new infrastructure in their settlement. Swimming pools are followed by fitness rooms and indoor running grounds. In my opinion, these responses reflect the special needs of the population, i.e., they would like to visit facilities which can provide sports opportunities even before and after working hours.

Based on the comparison of sports habits of respondents above 40 years of age to those of youngsters, they can be divided to two subgroups. In one of these groups, respondents do sports more frequently, while in the other, they do sports less than those in the younger age group. This phenomenon is likely to be the consequence of deteriorating health which is bound to happen in both groups, but while some pursue a more health conscious lifestyle to avoid progression (Melk et al., 2014), it is too late for others, i.e., their health conditions do not make it possible for them to do sports actively. The fact that these respondents' children already started their own adult lives; therefore, they have more time for themselves is a further factor which extends the former group of respondents. At the same time, the number of those who

have less time for doing sports due to their obligations as grandparents increases the latter group.

As a summary, it can be concluded that the efforts of the region in the field of improving sports culture had their initial success, but the maintenance of these achievements call for further expenditures. In addition, the areas in which the health consciousness of the population in Northeastern Hungary could be positively affected with little expense were also identified.

When analysing the time of the Hungarian population spent with outdoor activities (Hungarian Central Statistical Office, 2013), it was observed that the older age group (60-84 years of age) spends 14 minutes per day on average with walking, hiking and sports. The time balance analysis (HCSO) of Hungary in 2011 revealed that 15.3% of interviewed people between 15-74 years of age did not do any sports and walking and the proportion of people actively doing physical exercises during their free time decreases with the increase of age.

As a summary of the obtained results, it can be concluded that they are similar to the national average (HCSO, 2010), as 51.4% of respondents do not do sports at all. 9% of the population of the EU 27 regularly perform physical exercises in accordance with the Eurobarometer (2009) survey, while this value is only 5% in Hungary. The values obtained in the case of older respondents in this survey are similar to the Hungarian data of the Eurobarometer survey, only 2% of respondents do sports on a daily basis.

38.9% of those not doing sports refer to their health status, but a notable proportion of them do not even consider physical activities important (29%).

The aspects of choosing a specific branch of sports greatly differ in younger and older age groups. Spending time with friends and preserving one's health become increasingly important with age. As regards various branches of sports, women indicated swimming and men indicated ballgames most frequently. In addition, 23.2% of respondents ride the bicycle and 34% regularly walk to run errands and do shopping.

According to the related statistical data, the majority of diseases which cause the highest proportion of deaths are related to obesity and sedentary lifestyle. For this reason, the elderly population needs to be encouraged to be physically active in accordance with their conditions.

The range of central measures aiming at increasing the frequency of doing sports at old age is rather narrow, with the most important actions being the programs implemented as a result of initiatives by the civil society and grants.

In our opinion, the development of sports facilities improve the conditions of doing sports for all generations, even though much more intensive financial support and propaganda would be necessary in the case of the elderly.
Considering the fact that this age group can hardly be addressed as a target group with new initiatives, this situation is difficult to handle; therefore, a change of lifestyle cannot really be imagined. Turning people into a sports-centred lifestyle has to be started as early as child's age; therefore, daily P.E. classes may have a great role. Considering the aspects of older people choosing specific branches of sports, the establishment of the appropriate infrastructural background is indispensable, similarly to the wide range of organised community programs.

P.E. classes in school in childhood and at young age provide outstanding opportunities to learn and practice skills which improve life-long fitness and good health. This activity may be daily running, swimming, riding the bicycle, but it may include much more structured sports and games. The early attainment of fundamental skills help youngsters better understand the values of these activities and, accordingly, think responsibly during their subsequent studies or in their work and free time as adults.
At the same time, physical education does not only cover the development of physical abilities and it is not only a recreational activity, but participation in physical education also involves the understanding of principles and the attainment of concepts, such as rules of a game, fair play, honour, tactics, getting to know our social environment and our own body, which are indispensable in many branches of sports. The purposes which point beyond physical education and sports, such as health, proper personality development and social inclusion, further strengthen the inclusion of this subject into the curriculum.
Therefore, there is a reason why most European countries have some kind of strategy of sports training in school (European Commission, 2014**)**. For this reason, the EU recommended its Member States to work out national plans for sports training in schools in order for the society to realise that physical activity results in positive effects on one's health (EU physical activity guidelines, 2008) and also contributes to the improvement of one's studies (Shephard, 1997; Dwyer et al., 2001; Hawkins and Mulkey, 2005; Carlson et al., 2008; Pfeifer and Cornelißen, 2010). In the United Kingdom, the situation of physical education in schools has been evaluated

multiple times. It was concluded that the standard of education increased in the examined period (2005-2008), but the knowledge and preparedness of primary school teachers lagged behind highschool P.E. teachers mostly because they did not use to have the necessary training at the beginning of their career and have not acquired it ever since. Most schools measured and regularly monitored the development of their students, but it was not possible to accurately determine success level due to the lack of a national benchmark (Ofsted, 2009). The survey carried out in 2013 came to similar conclusions (Ofsted, 2013). One quarter of the monitored schools turned out not to have motivated their students to improve their stamina and only a few schools introduced individually tailored physical education programs which, for example, consider the special needs of obese students.

Similarly to our findings, it was also observed in other European countries that schools do not have the necessary infrastructure; therefore, the obtained further support by means of cooperations with local communities, the local authorities and companies which help them establish the necessary sports facilities (Acker et al., 2011; König, 2012; Kosztin et al., 2015). In Belgium and the United Kingdom, the given community supports the school, the physical activity of students outside classes, thereby taking a role in developing and providing the necessary infrastructural background.

In 2011, the Ministry of Education in the United Kingdom had a survey carried out on how much the Olympic Games to be organised in 2012 affected schools in popularising physical education-related objectives, increasing the number of athletes and whether it changed students' approach to sports and physical education. One third of teachers answered that they had built the set of values of the Olympic Games into the curriculum. They concluded that the majority of students enjoyed the restructured physical education classes and the fact that they could learn new things about sports. One third of schools introduced new branches of sports in relation to the program (Bunt et al., 2011).

The Hungarian Government also set the aim to preserve and develop our internationally acknowledged achievements in the field of performance sports; therefore, they decided to support the training of athletes because they wish to find the excellent Hungarian athletes in the emerging generation and it can only be provided by establishing a comprehensive mass base.

The sports school system is not only a Hungarian phenomenon. According to an international study, the sports school system and, accordingly, the training of athletes is considered to be everyday practice in many countries of the world (Radtke, 2007). In general, it can be stated

that the establishment of sports schools took place in the early 1990s in most countries. The number of sports schools ranges between 10-30 in the examined countries, except in Germany and Sweden, the latter of which hosting more than 60 such institutions. Of the examined countries, the highest number of students (11000) was observed in Germany. These numbers probably increased during the last ten years; therefore, it can be concluded that the 54 sports schools in Hungary and the number of sports school students can be considered favourable in international comparison. The sports schools in the examined countries were also state-funded. In most countries, young athletes are expected to conform to the normal study requirements. Similarly to our findings, a wide range of branches of sports is available in the sports schools of the countries examined by the study. At the same time, there are also specialised sports schools which provide the training of one or two branches of sports. Usually, these schools have indoor sports courts.

Sports clubs may facilitate physical education and the training of athletes in schools not only by means of operating sports schools, but also with targeted programmes (Evaluation of the Change 4 Life School Sports Club Programme, 2011).
A British study (Ofsted, 2005) concluded that the connection into the sports school program positively influenced physical education and sports activities mainly in the case of primary schools. As a consequence, not only more time and attention was spent on physical education classes, but the range of sports activities at the school and extracurricular sports opportunities was also widened. Highly trained trainers from sports clubs were regularly involved in school sports activities in the cases if a partnership was developed with certain sports clubs.

Altogether, it can be stated that Hungary has significant shortcomings in terms of the number of sports facilities in comparison with notable European examples, but the facility management efforts of the latest period and the support systems of each branch of sports resulted in a gradual extension of the range of sports opportunities and the standard of services. Sports schools have a positive influence on the training of athletes and, accordingly, Hungarian physical education, as well as sports life. Currently, 36 000 students take part in the program. The state plays a key role in this area, however, additional financial resources would be needed for development.

This study showed the sports habits of the region’s population. The main reasons for not doing sports were revealed, as well as the nature of human resources and facility management which would improve the health behaviour and, therefore, the fitness of the region’s population.

## 4. NEW AND NOVEL SCIENTIFIC FINDINGS

### 1. Comparative analysis of the fitness of the young population in the North Great Plain and the West Transdanubian region

Based on our analysis the fitness data of the two examined regions, with special regard to stamina, are different form one another. While those obtained from the West Transdanubian region are better, those from the North Great Plain are worse than the Hungarian average. It has to be emphasised that the stamina of the 18-year-old age group looks rather sad both in the case of males and females, since only one third of them conform to the related health care requirements. Consequently, a clear and conscious regional sports development strategy needs to be worked out and implemented.

### 2. Sports habits of the population in the North Great Plain region

Based on our examination of the population's sports habits, it can be concluded that the habits which developed at young age are not changed even at adult age. In our region, the overwhelming majority (nearly 80%) do sports only once per week or even less often. The majority of those who do not exercise sports refer to the lack of time or motivation and fatigue. The background of this phenomenon most probably lies in the activities related to work and family at adult age. It would be important to take measures not only by the government, but also employers in order to improve this situation, since the proper health status and general wellbeing of employees are significant factors also from the aspect of the workplace. Our study has also shown that fatigue is a more frequent reason for not exercising among female respondents, which may be the result of the still existing uneven distribution of labour between genders.

### 3. Infrastructural needs

Our survey has shown that respondents are not discouraged by the fact that they have to pay for using a sports facility. At the same time, they would like to have facilities they can use independently of weather, at any time of the day in their close vicinity, such as swimming pools, gyms, and running grounds. All these findings show that it is worth considering the building of complexes in the regional sports facility development which satisfy this need of the population, even if they offer pay services only.

**4. Survey and comparative analysis of sports habits at old age using young people's sports habit pattern**

Our results revealed clear differences in the sports habits at old age in comparison with younger generations. Due to the change of their health conditions, people above 65 years of age usually prefer sports activities which they can perform in communities and do not overstress their bones and joints. Accordingly, swimming and therapeutic gymnastics performed in groups have important role in addition to work around the house and walking. All these aspects further strengthen the needs for facility development referred to in the previous point.

**5. Hungarian and regional analysis of the sports school system**

Our work pointed out that public education type sports schools host significantly higher number of students than sports club type sports schools, but they still train much less (usually 2-4) branches of sports. It would be important to support these institutions to extend the range of available branches of sports as part of a government-level sports policy concept. As a matter of fact, such measure calls for proper infrastructural developments and – even more importantly – the extension of P.E. teacher staff, as well as their constant continued education.

## 5. RESULTS TO BE USED IN PRACTICE

The practical findings of this research included revealing the current problems in the society to which potential recommended solutions were provided.

Physical activity is a key component of healthy lifestyle. The measures which encourage the wide range of the population to take part in regular sports activities and establish the necessary conditions significantly contribute to the improvement of the society's health conditions and, as a result, the improvement of economic competitiveness.

1. As a result of the performed analyses, it was concluded that it is necessary to have affordable sports facilities which satisfy the needs of all age groups and which can be used independently of the weather in order for a wider range of the population to take part in everyday physical activity.

2. The sports school system greatly helps children at school age do sports. However, the extension of available branches of sports would be important in order to turn the interest of students towards sports school activities even more. As a matter of course, this measure would call for the development of the existing infrastructure, especially the facilities serving special needs.

3. It is necessary to increase the number of programs supporting "inclusion" in order to increase the physical activities of the elderly. During this research, physical activity types preferred by older people were surveyed; therefore, special emphasis needs to be laid on developing community spaces which serve these purposes.

4. During the work performed in this research, it was revealed that the fitness of a population living in an economically backward region is below the country average and also that of an economically more developed region. In order to develop a less favoured region, it is necessary to perform government and employer measures, as well as to allocate grant funds.

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# 7. PUBLICATION LIST

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Magyar nyelvű tudományos közlemények hazai folyóiratban (1)

1. Balatoni, I., **Kith, N.**, Csernoch, L.: Időskori sportolási szokások vizsgálata Észak-kelet Magyarországon.
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Idegen nyelvű tudományos közlemények külföldi folyóiratban (2)

2. Balatoni, I., **Kith, N.**, Kosztin, N., Csernoch, L.: The system of sports schools in respect with youth-training in Hungary.
   *J. Educ. Health Sport. 6* (13), 42-53, 2016. EISSN: 2391-8306.
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   *J. Health Sci. 4* (13), 46-59, 2014. ISSN: 1429-9623.
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## További közlemények

Magyar nyelvű absztrakt kiadványok (3)

4. Jenes, Á., Balatoni, I., **Kith, N.**, Kosztin, N., Csernoch, L.: Az olimpiai éremszerzés optimális életkora.
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Idegen nyelvű absztrakt kiadványok (1)

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   *Sci. Gymnast. J. 7* (3), 136-137, 2015. EISSN: 1855-7171.

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